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ROBERT M MASTERS
SUGHRUE MION ZINN MACPEAK AND SEAS PLLC
2100 PENNSYLVANIA AVENUE NW
WASHINGTON, DC 200373212

EXAMINER	
GESESSE, TILAHUN	
ART UNIT	**PAPER NUMBER**
2684	6

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/453,526	SMITH, HARRY B.	
	Examiner	Art Unit	
	Tilahun B Gesesse	2684	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-68* is/are pending in the application.

4a) Of the above claim(s) *1-11,20-22,30-33,53,54,57-60,63 and 65-68* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-19,23-29,34-41,62 and 64* is/are rejected.

7)☒ Claim(s) *42-52,54,55 and 61* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of s 12-19,23-2934-5255,56,61 and 64 in Paper No. 5 is acknowledged.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

3. Claim 23 is objected to because of the following informalities: in lines 6-7 "said antenna array antennae array" there is redundancy or spell error. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 12 is recites the limitation "said information and said matrix" in lines 7 and 8. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 12-16,19,23-24,26,28-29,34-36,39-41,64 are rejected under 35 U.S.C. 102(e) as being anticipated by Molar et al "Molar" (6,081,566).

As to claim 12, Molar discloses a receive system (figure 2) capable of minimizing affects of thermal noise introduced by the amplification of a signal, said system comprising: to an antenna operable to receive a plurality of overall receive signals (column 7, lines10-15), an amplifier operable to amplify each of said overall receive signals ((column 7, lines 17-20), an analog to digital converter (106) operable to convert said overall receive signals from an analog format to digital values(column 7, lines 20-23) a processor operable to iteratively process said digital values to determine

information and place said information in locations within matrix (column 7, lines 24-34) a phase multiplier operable to multiply signal-only data from said processor with a plurality of phase values and output phase multiplied data(column 8, lines 22-57) and a combiner operable to combiner ((203) said phase multiplied data (column 8, lines 22-57 and figure 1 and 2).

As to claim 13, Molar discloses a local oscillator operable to generate a reference signal; and a mixer operable to heterodyne said reference signal with said overall receive signals to generate a lower frequency version of said overall received signals (column 7, lines 17-20).

As to claim 14, Molar dislcoses a zero phase reference is established that is synchronized to a system timing generator from which reference in-phase (I) and quadrature (Q components are established, said I and Q components being processed independently (column 7, lines 27-34)

As to claim 15, Molar discloses operable to separately generate digital in-phase and quadrature samples of said overall receive signals wherein said quadrature samples are approximately 90 degrees out of phase with respect to said in-phase samples (column 7, lines 27-34)

As to claim 16, Molar discloses the antenna comprises a two dimensional array of elements grouped into a plurality of corresponding right-left groups, each right-left group being centered on a center group wherein each of said elements is spaced an integer multiple of a half-wavelength from a respective adjacent element (column 2,lines 1-5 and figure 1).

As to claim 19, Molar discloses a plurality of outputs from said phase multiplier are coherently combined to increase an angular sensitivity of the receive system (figure 2).

As to claim 23, Molar dislcoses a receive system (figure 2) comprising an antenna array with two interoperable arrangements of elements (105), said antenna array operable to provide signal-plus-noise outputs to an iterative processing method (column 7, lines 12-16), said iterative processing (203 and 204 of figure 2) method being capable of; achieving dramatic signal-to-noise ratio improvement, improving the ability to distinguish weak signals received by said antenna array antennae array (column 7, lines 12-16), and improving angular discrimination by sharpening a beam of said antenna array (column 2, lines 45-56 and figure 1), wherein said angular discrimination is improved by a phase multiplying process using two or more groups of said receive signals, each group having a separation of different numbers of half wavelengths (column 2, lines 45-56 and figure 2).

As to claim 24, Molar discloses a method of improving an angular resolution in a receive system (figure 1, method comprising the steps of: aggregating signal-plus-noise data output from an antenna into a plurality of groups, each group containing data having a similar phase, wherein the phase corresponding to each group is a multiple of the phase corresponding to the other groups, said multiple being determined by a spacing between the right and left elements of each group from the center of the antenna array (column 3, lines 35-45, column 12, lines 44-54 and figures 1 and 2).

As to claim 26, Molar dislcoses iteratively processing the data in said group to

reduce a noise portion of a signal plus noise average to derive a relatively noise-free representation of the angle associated with an arrival direction of the signal from said group (figure 2).

As to claim 28, Molar discloses the iterative processing step includes the step of sequentially applying a series of digital values to said data to alter a value representing signal plus noise with the result of each iteration to obtain an estimate of a noise portion of the signal plus noise by algebraically summing values of the several iterative steps (figure 2).

As to claim 29, Molar discloses the iterative processing step includes; sensing, in a bipolar manner, a change in the data, caused during each iteration, wherein a magnitude of the change is determines equally for both plus and minus values of the noise component of the signal-plus-noise samples in a symmetrical bipolar manner and the result of each iterative value applied is assessed to determine. the next subsequent value in a way that constitutes an overall feedback system (figure 2).

As to claim 34, Molar discloses a receive system comprising; an antenna array with right and left side elements operable to receive signal-plus-nose signals (column 7, lines 10-16), a means for aggregating outputs of selected right and left side elements of said antenna array to form an aggregation of signal-plus-noise voltages in digital form, said digital values being appropriate for forming aggregations in a form to perform subsequent near-real time iterative processing (column 12, lines 44-54 and figures 1 and 2).

As to claim 35, Molar discloses a processor (107) operable to identify a particular

entry of a subset of said aggregation that has the least absolute deviation from an average of the subset, wherein said identified entry represents an entry whose noise is closest to the average noise component of the signal plus noise average of the aggregate group (processor 107 which processes these streams to produce an estimate of the transmitted digital symbol streams, S, column 5, line 56-column 6, line 4 and figures 1 and 2) .

As to claim 36, Molar discloses subset (antenna array signals) includes separate in-phase (I) and quadrature (Q voltage outputs and provides the signal and noise in a first row of a two row numerical array of digital numbers with a second row consisting of the signal plus noise average for each of the separate I and Q aggregations (column 4, lines 6-20).

As to claims 39-40, Molar discloses a method of processing signals received by a receiving system (107), said method comprising: forming left and right topological groupings of digital representations of said signals said groupings formed about a topocentric reference(radio units 105) that corresponds to a zero value injection from a stored predetermined value injection pattern comprised of positive and negative steps, which are incrementally increasing in magnitude, in each of two or snore rows of similar increments having a common topocentric zero reference (figures 1 and 2 and column 7, lines 10-34).

As to claim 41, Molar discloses a method of processing signals received by an array of a receiving system (figure 1) , said method comprising; configuring a numerical

array of modified signal-plus-noise values representative of said received signals such that each noise portion of said signal-plus-noise value transitions through zero at a location in the array (column 12, lines 44-61), said location being determined by the polarity and magnitude of said noise (column 11, lines 25-65), and sensing how the injection of a programmed iterative value will change a relative location within said array by sensing, in progressive steps, when each injected iterative value causes a match in the numerical values of signal-plus-noise from two rows of the numerical array to be further from, or closer to, a topocentric center of left and right portions of the array (column 13, lines 4-25).

As to claim 64, Molar discloses a receptivity to radio frequency signals provides a signal strength, relative to inherent noise, characteristic that is equivalent to that which is expected from an antenna with a larger aperture, and wherein said signals have improved directivity and angular resolution over a wide range of radio frequencies permitting better utilization of an allocated or an independently chosen frequency spectrum (figure 1).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 17-18, 25,27,62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Molar in view of Rostamy et al "Rostamy" (6,330,431).

As to claims17-18,25,27,62, Molar does not specifically disclose, Beta, and an electrical phase angle, phi, is obtained that corresponds to a physical angle, theta, which is approximately equal to a phase difference between a normal to the antenna and a receive angle of said overall receive signals, to measure the electrical phase angle, phi, of said receive signal. However, Rostamy discloses Beta and phi of the received signal is adjusted to eliminate error (column 4, lines 6-14). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to combine Molar and Rostamy in adjust the receive signal in electrical reception angle, for improve signal reception.

9. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Molar in view of .Saito et al "Saito" (5,203,023)

As to claim 38, Molar dislcoses all the limitation as explained above, except a deviation determining device operable to select datapoints, representing data from each of said antenna array elements, and arrange said datapoints in a other evenly distributed group and device determines a deviation for each individual datapoint. However, Saito dislcoses phase deviation data received on antenna array (101 and 102) compared the output stage by a level comparison (107) (column 1, lines 28-45 and figure 1). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention was made to combine Molar and Saito in comparing receive phase signal data against the deviation of with the highest received data ,as taught by Saito, in order to

reject the interfering signals from receiving.

Allowable Subject Matter

Claims 37,42-52,55-56,61 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art does not disclose the producing a sequence of controlled steps to create a series of discrete voltage values using an iterative program in which each value alters the signal plus noise value to create a new signal plus noise value for each entry of both left and right portions of the topographical numerical array; sensing how each iterative step alters the entries of selected rows of the topographical digital numerical array; and determining when a numerical match of values occurs between various columns of said array; reading a column entry from the average row and the column in another row, different from said average row, that has been shifted by an amount equal to the algebraic sum of the minimum deviation value together with a left or right shift furnished as part of an instruction from said iterative program.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Jasper et al (6,251,955) discloses an antenna array portion of communication device receives a desired signal and an interfering signal and combine various signals from the second antenna (abstract).

Barratt et al (6,185,440) discloses apparatus for transmitting a downlink signal from a communication station to one or more subscriber units to achieve a desired ration level over a desired sector (abstract).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tilahun B Gesesse whose telephone number is 703-308-5873. The examiner can normally be reached on flex.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on 703-308-7745. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

TBG

Art Unit : 2684

October 31, 2003

TILAHUN GESESSE
PATENT EXAMINER